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BULLETIN  
OF THE  
TORREY BOTANICAL CLUB

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JUNE, 1915

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Some new species and varieties of *Bihai*\*

ROBERT F. GRIGGS

(WITH PLATE 19 AND SIX TEXT FIGURES)

For a number of years the writer has contemplated publishing a revision of the musaceous genus *Bihai*. Inasmuch as this has been much delayed, it has been thought wise not to withhold the publication of the several new species which have come to light in the course of the work. In order to enable the student rightly to place the new species among the old a key to all the species is also given. The preparation of this in turn has involved the revision of the subgenera and minor groups which is herewith presented.

*Intragenetic Relationships*.—In previous treatments the species have been grouped under two subgenera, which under somewhat varied characterizations included respectively the large species and the small species. The first of these to receive a name, *Taeniostrobos*, was founded by Kuntze on his *B. imbricata*. Baker, however, ignored Kuntze's name and included this species under his own subgenus *Platyklamys*, with *B. Bihai* as type, which was taken as synonymous with *Taeniostrobos* by Schumann and replaced by it. The narrow bracted species were thrown together by Baker under the name *Stenochlamys* (type *B. psittacorum*) and this was adopted by Schumann. While one recognizes a more or less natural subdivision of the genus around these types there are no characters by which it can be so divided without tearing

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asunder closely related species, such for example as *B. longa*, *B. pendula*, and *B. marginata*, which though very closely related, differ in size and width of the bracts so much that they are necessarily thrown into different subgenera by the key characters. As one goes through the genus he finds so many difficulties of this sort that it becomes clear that some other method of subdivision is necessary. A new classification is therefore proposed which while retaining the old subgenera as recognizable primary subdivisions, even if they are somewhat indefinitely characterized, is mainly built around smaller groups of rather closely similar species. The names of these groups have been taken from the specific names of characteristic species, indicating therefore categories of lower rank than the subgenera with their substantive designations. Before proceeding to the key it may be well to outline this proposed classification.

#### TAENIOSTROBUS

EPISCOPALES, including only *B. episcopalis*.

IMBRICATAE, including *B. conferta*, *B. Wagneriana*, *B. imbricata*, *B. densa*, *B. reticulata*, *B. punicea*, *B. Mariae*, and *B. curtispatha* (intermediate).

PENDULAE, including *B. rostrata*, *B. longa*, *B. revoluta*, *B. pendula*, *B. Collinsiana*, *B. villosa*, *B. platystachys*, and *B. marginata*.

CHAMPNEIANAE, including *B. Bihai*, *B. Champneiana*, *B. barqueta*, *B. borinquena*, *B. rutila*, *B. purpurea*, *B. stricta*, and *B. humilis*.

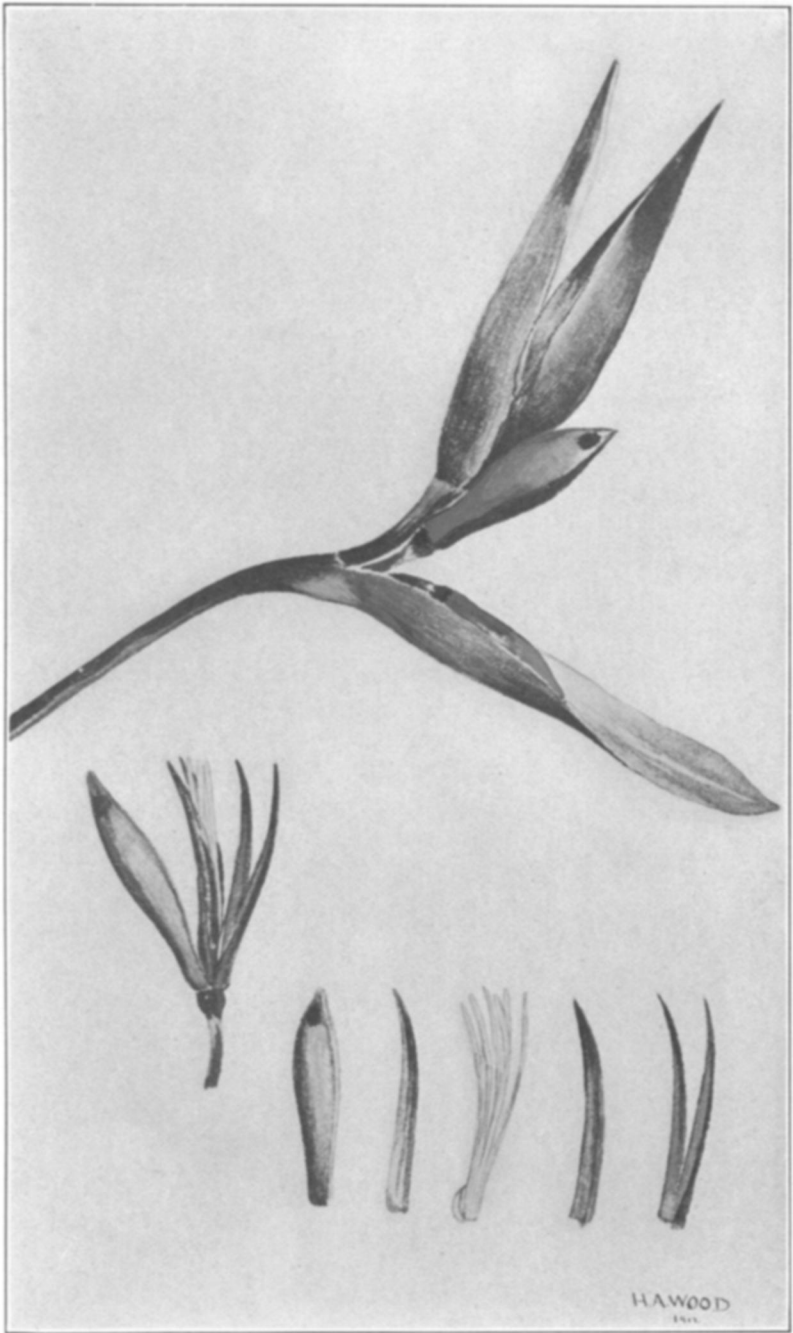
#### STENOCHLAMYS

DISTANTES, including *B. velligera*, *B. metallica*, *B. spissa*, *B. dasyantha*, *B. tortuosa*, *B. geniculata*, *B. librata*, *B. adflexa*, *B. lingulata*, *B. distans*, *B. latispatha*, *B. brasiliensis*, *B. acuminata*, and *B. Burchellii*.

CANNOIDEAE, including *B. glauca*, *B. densiflora*, *B. angusta*, *B. crassa*, *B. aurantiaca*, *B. straminea*, *B. Harrisiana*, *B. hirsuta*, and *B. psittacorum*.

#### Key to the species of Bihai

1. Branch-bracts closely imbricated forming a compact spike .....2.
1. Bracts standing apart, distant or slightly overlapping when in flower .....11.
2. Bracts persistent (IMBRICATAE) .....3.



BIHAI HARRISIANA GRIGGS

2. Bracts deciduous, strictly ascending, scarlet with yellow margins.  
*B. episcopalis* (Vellozo) Kuntze.
3. Inflorescence 25 cm. broad at base.....4.
3. Inflorescence about 15 cm. broad.....5.
4. Rachis straight, leaves rounded to the base...*B. conferta* (Peters.) Kuntze.
4. Rachis somewhat flexuose, leaves cuneate, very inequilateral.  
*B. Wagneriana* (Peters.) Kuntze.
5. Inflorescence erect or "suberect".....6.
5. Inflorescence pendulous.....8.
6. Leaves green, inflorescence peduncled.....7.
6. Veins and veinlets conspicuously marked with red, inflorescence sessile, close to the ground, red and yellow.....*B. reticulata* Griggs.
7. Inflorescence 15 cm. wide, bracts 10 cm. long.....*B. imbricata* Kuntze.
7. Inflorescence scarcely exceeding 10 cm. in width, middle bracts 4-5 cm. long.  
*B. densa* Griggs.
8. Bracts suborbicular, widest at the middle, rose red, plant very large.....10.
8. Bracts ovate, widest below the middle, medium sized plants.....9.
9. Inflorescence deltoid, somewhat loose, red purple.....*B. punicea* Griggs.
9. Inflorescence oblong, dense, scarlet.....*B. densa* Griggs.
10. Bracts closely imbricated, concealing the rachis, flowers rose colored where exposed.....*B. Mariae* (Hook. f.) Kuntze.
10. Bracts touching only at the middle, not concealing the rachis, flowers yellow.  
*B. curtispatha* (Peters.) Kuntze.
11. Inflorescence pendent (PENDULAE).....12.
11. Inflorescence erect.....20.
12. Bracts broad, nearly as wide as long when flattened out.....13.
12. Bracts narrow, not more than half as wide as long.....15.
13. Bracts rhomboid, widest at the middle, close and slightly imbricated.  
*B. curtispatha* (Peters.) Kuntze.
13. Bracts ovate, widest below the middle, spaced out on the rachis.....14.
14. Rachis rather short, bracts rather close, margined with green, suddenly narrowed above the strongly rostrate tip, plant below medium size.  
*B. rostrata* (Ruiz & Pavon) Griggs.
14. Inflorescence very long, bracts remote, scarlet, bright rufous pubescent within, gradually narrowed to the tip, plant very large.....*B. longa* Griggs.
15. Bracts scarlet, flowers yellow.....16.
15. Bracts variegated, red with yellow edges.....18.
16. Bracts only slightly concave, margins revolute.....*B. revoluta* Griggs.
16. Bracts boat-shaped, not revolute.....17.
17. Peduncle, rachis and bases of bracts ferruginous-pubescent, rachis strongly flexuose, leaves typically green beneath.....*B. pendula* (Wawra) Kuntze.
17. Glabrous throughout, rachis nearly straight, leaves heavily glaucous.  
*B. Collinsiana* Griggs.
18. Peduncle and inflorescence densely villous with long bright rufous hair, flowers white.....*B. villosa* (Klotzsch) Kuntze.
18. Inflorescence merely puberulent.....19.
19. Plant large, rachis nearly straight, middle bracts exceeding 10 cm., flowers reddish.  
*B. platystachys* (Baker) Griggs.
19. Plant of medium size, rachis strongly flexuose, middle bracts less than 10 cm. long.  
*B. marginata* Griggs.

20. Rachis about 2 cm. in diameter, bracts glabrous, thick and fleshy, shriveling much in drying (CHAMPNEIANAE) .....21.
20. Rachis seldom exceeding 1 cm. in diameter, bracts mostly chartaceous, shriveling little .....30.
21. Inflorescence long-peduncled, scarlet.....*B. Bihai* (L.) Griggs.
21. Inflorescence sessile.....22.
22. Bracts of one color.....23.
22. Bracts variegated.....26.
23. Flower with a subgibbous expansion on the anterior side, filaments strongly bent, petals of nearly the same texture as the sepals.....25.
23. Flower merely arcuate, petals very delicate, shorter than the sepals.....24.
24. Inflorescence orange.....*B. Champneiana* Griggs.
24. Inflorescence rose colored.....*B. barqueta* (Loes) Griggs.
25. Inflorescence orange.....*B. borinquena* Griggs.
25. Inflorescence scarlet.....*B. borinquena coccinea* Griggs.
26. Bracts margined with yellow.....27.
26. Bracts red and green.....28.
27. Bracts red and yellow, narrowly ovate, about 6 cm. wide, barely touching each other, perianth 5 cm. long, posterior sepal broadly lanceolate..*B. rutila* Griggs.
27. Bracts purple and yellow, 8-10 cm. wide, close together, perianth segments 6 cm. long, linear-oblong.....*B. purpurea* Griggs.
28. Bracts scarlet with green margins, few, plant rather small (2 m.), leaves scarcely exceeding 1 m.....29.
28. Bracts green with a patch of red on the cheeks, more numerous, plant up to 4 m. tall, leaves elongate, cuneate-oblong.....*B. elongata* Griggs.
29. Bracts very broad, 6 cm. deep, plant about 1.5 m. tall, flowers tipped with white.  
*B. stricta* (Huber) Griggs.
29. Bracts about 3 cm. deep, larger, flowers colorless below, green where exposed.  
*B. humilis* (Jacq.) Griggs.
30. Medium sized plants, leaves commonly surpassing 50 cm., habit musoid or sub-musoid (DISTANTES).....31.
30. Small plants, commonly about a meter tall, if taller very slender, leaves about 30 cm. long, habit cannoid (CANNOIDEAE).....46.
31. Not villous.....32.
31. Inflorescence thickly covered with very long hair.  
*B. velligera* (Poepp.) Kuntze.
32. Leaves green or glaucous, bracts colored.....33.
32. Leaves purple beneath, bracts green...*B. metallica* (Planch. & Linden) Kuntze
33. Inflorescence persistently hairy.....34.
33. Inflorescence glabrous unless when young.....37.
34. Inflorescence long peduncled, bracts more or less twisted out of the distichous arrangement.....35.
34. Inflorescence sessile, bracts distichous, prevailingly yellow...*B. spissa* Griggs.
35. Bracts solid red.....36.
35. Bracts green with red cheeks, flowers yellow.  
*B. dasyantha* (Koch. & Bouché) Kuntze.
36. Bracts ovate-lanceolate, flowers green, only their tips exerted.  
*B. tortuosa* Griggs.

36. Bracts narrowly lanceolate, flowers yellow, geniculate, standing out of the bracts at anthesis.....*B. geniculata* Griggs.
37. Bracts slightly concave, their edges revolute.....38.
37. Bracts boat-shaped, not revolute.....39.
38. Middle bracts about 15 cm. long, yellow with purple tips.  
*B. lingulata* (Ruiz & Pavon) Griggs.
38. Middle bracts about 7 cm. long, scarlet, inflorescence long peduncled.  
*B. adflexa* Griggs.
39. Perianth 15-20 mm. long, inflorescence deltoid, compact...*B. librata* Griggs.
39. Perianth 30-60 mm. long, inflorescence oblong, rather lax.....40.
40. Inflorescence orange.....41.
40. Inflorescence red.....42.
41. Flowers exserted, rachis very flexuose, bracts, at least the lower, strongly falcate.  
*B. distans* Griggs.
41. Flowers and their bracts entirely included, rachis and bracts nearly straight.  
*B. latispatha* (Benth.) Griggs.
42. Bracts reaching 15 cm. in length.....43.
42. Bracts 5 cm. long, all deflexed, flowers golden yellow.  
*B. Burchellii* (Baker) Griggs.
43. Flowers straight or slightly arcuate, not closely appressed nor suddenly erected.44.
43. Perianth geniculate at anthesis, flowers numerous but opening one or two at a time, appressed to the channel of the bracts until near anthesis, then quickly raised by a bend in the pedicel, bracts scarlet, horizontal, three ranked, of very diverse ages.....*B. geniculata* Griggs.
44. Margins of bracts not involute, flowers reddish (or yellow), habit cannoid.  
*B. acuminata* (Rich.) Kuntze.
44. Margins of the bracts involute, all arcuate ascending, flowers greenish white..45.
45. Leaves green beneath.....*B. brasiliensis* (Hook.) Kuntze.
45. Leaves glaucous.....*B. brasiliensis pulverulenta* (Hook.) Griggs.
46. Bracts as brightly colored as the rachis, leaves green on both sides.....47.
46. Bracts and flowers yellowish green, rachis and pedicels red, leaves glaucous.  
*B. glauca* (Poit.) Kuntze.
47. Bracts exceeding 10 cm. in length.....48.
47. Bracts, unless the lowest, scarcely reaching 10 cm.....50.
48. Bracts spreading at flowering time, not involute, flowers not tipped with black.49.
48. Bracts strictly ascending at flowering time, involute and bayonet pointed, flowers tipped with black.....*B. densiflora* (Verlot) Kuntze.
49. Leaves narrowly oblong, flowers white, pedicels orange.  
*B. angusta* (Vellozo) Griggs.
49. Leaves elliptical, flowers reddish (or yellowish), pedicels red.  
*B. acuminata* (Rich.) Kuntze.
50. Flowers not darkened at the tip, yellow.....51.
50. Flowers maculate.....53.
51. Bracts red.....52.
51. Bracts orange, leaves mostly petioled.....*B. crassa* Griggs.
52. Bracts somewhat ascending, rachis green, leaves about 30 cm. long, sessile, subcordate, peduncle short, flowers pale yellow.  
*B. aurantiaca* (Ghiesb.) Kuntze.
52. Bracts all deflexed, leaves reaching 60 cm., rounded at the base, peduncle elongated, flowers golden yellow.....*B. Burchellii* (Baker) Griggs.





bracts 4-5 cm. long, 5-6 cm. wide, widest near the base; flowers about a dozen to a bract, only their tips visible, bracteoles delicate,  $30 \times 12$  mm., flower very small, perianth 20-25 mm., sepals pubescent, thick, indurated at the tips, the posterior 2-3 mm. longer than the other floral parts, petals 3, pedicels finally about 12 mm., berries 9 mm. in diameter (dry) concealed within the bracts. [TEXT FIG. 1.]

PANAMA: around Dos Bocas, Rio Fató Valley, province of Colon, altitude 40-80 m., in dark shady forest, August 16, 1911, *H. Pittier*. Type in National Herbarium, sheet 678445.

*Bihai densa* is nearest *B. punicea* from which it differs especially in the shape and color of the bracts, and the flower characters. The only one of the previously known species which could be mistaken for either is *B. imbricata*.

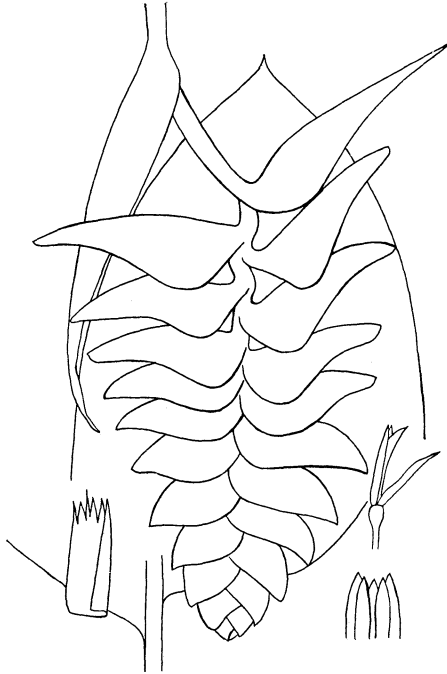


FIG. 2. *Bihai punicea* Griggs; three-eighths natural size.

***Bihai punicea* sp. nov.**

Plant of medium size, leaf about 1 m. long, 25 cm. wide, green and glabrous, acute; inflorescence pendent, deltoid, about 12 cm. wide, a little longer, peduncle 30 cm. long, 7 mm. thick (dry),

glabrous, rachis nearly straight, stiff, glabrescent, concealed above but visible below, bracts twenty-three in the type, mostly horizontal, red-purple, covered with tawny hair, boat-shaped, ovate when opened out, widest near the base, slightly arcuate, very obtuse, except the lower, those from the middle of the inflorescence about 5 cm. long, of the same breadth, the lowest 14 cm., the highest only about 1.5 cm.; flowers a little shorter than the bracts, less numerous than in allied species, bracteoles ample,  $40 \times 25$  mm., obtuse and frayed at the tip, persistent, flowers curved up out of the bracts toward the large sepal, perianth about 3 cm. long, lateral sepals free, corolla limb tridentate, the middle tooth smaller than the other two. [TEXT FIG. 2.]

PANAMA: between Gorgona and Gatun, altitude 10-50 m., Smithsonian Biological Survey, January 7, 1911, *H. Pittier 2290*. In National Herbarium, sheets 677161, 676544, 676545.

***Bihai revoluta* sp. nov.**

Plant of medium size, leaf (known to me only from a sucker) elliptical,  $50 \times 15$  cm., acuminate, rounded to the slightly decurrent base, green and glabrous; inflorescence pendent, red, rachis straight, flexible, internodes mostly about 3 cm. long, covered with abundant evanescent ferruginous tomentum, bracts numerous, horizontally divaricate, more or less tomentose at the base, linear-oblong, obtuse, slightly concave, their margins conspicuously revolute soon after opening, middle ones about 12 cm. long, 2 cm. wide: bracteoles persistent, about  $1 \times 5$  cm., glabrous, flowers rather numerous, pedicel and ovulary red, perianth yellow, glabrous, about 5 cm. long, sepals thick, free, petals two (in the type), shorter by 2-3 mm. and much more delicate than the sepals. [TEXT FIG. 3.]

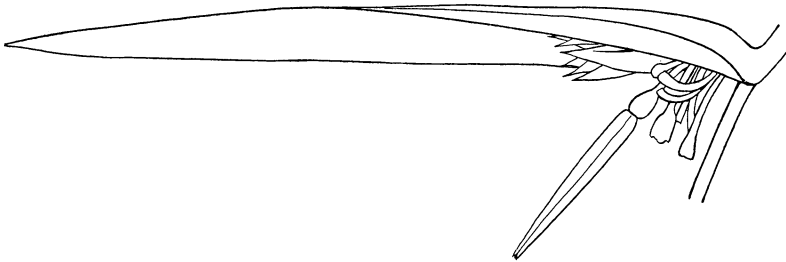


FIG. 3. *Bihai revoluta* Griggs; about half natural size.

COLOMBIA: Santa Marta, 1898-1901, *H. H. Smith 2315*, with the following field note: "Thickets and forest near streams, 3,500-5,000 feet. Bract and pedicel red, flower yellow. Specimen is from Manzanares, 3,500 feet, March 1." Type in the herbarium

of the New York Botanical Garden; specimens seen also from the Missouri Botanical Garden and from the National Herbarium. The following station may likewise be recorded: Orizaba, MEXICO, *Botteri* 523.

The narrow revolute bracts of this species at once differentiate it from all other known species except *B. lingulata* and *B. adflexa*. There is, however, no close resemblance between the stiff erect inflorescence of *B. adflexa* and the lax panicle of the present species. The resemblance to *B. lingulata* is much closer, but that species has yellow bracts and a compact inflorescence with internodes only one third as long.

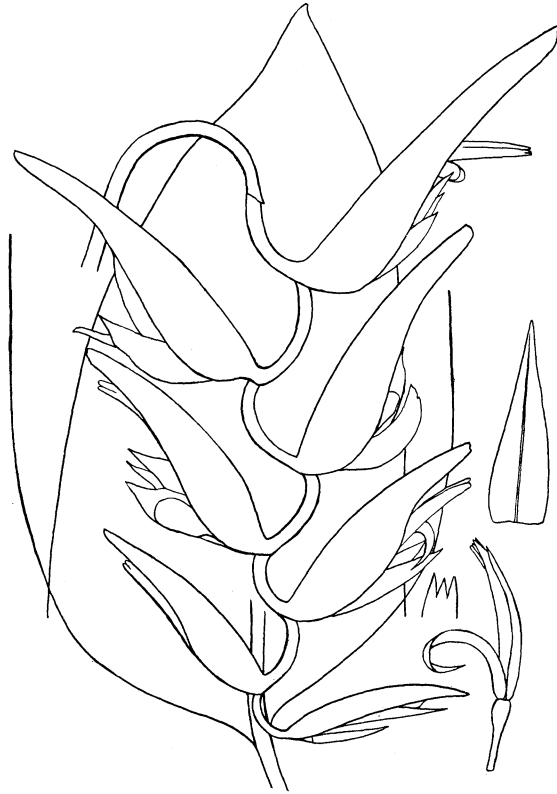


FIG. 4. *Bihai marginata* Griggs; about three-sevenths natural size.

***Bihai marginata* sp. nov.**

Plant about 4 m. tall, trunk 6 cm. in diameter at base, petiole 50 cm. long, leaf blade  $60 \times 15$  cm., oblong, acute, rounded at the

base, green and glabrous on both sides; inflorescence pendent, less than 20 cm. long in the type, 10–12 cm. wide, exposed portion of the peduncle less than 10 cm. long, slender, about 5 mm. in diameter, softly puberulent with light brown hair, rachis strongly flexuose in smooth curves, stiff, minutely puberulent, internodes about 25 mm. long, bracts eight in the type, all reflexed, scarlet with yellow margins, somewhat puberulent, shallowly boat-shaped, ovate-lanceolate when flattened out, gradually narrowed to an obtuse tip, those in the middle of the inflorescence 8–9 cm. long, 4 cm. wide; flowers rather numerous, the younger pushing the ripening fruit out beyond the edges of the branch bracts, bracteoles  $60 \times 15$  mm., triangular-lanceolate, very acute, pubescent on the back, persistent in fruit, perianth 5 cm. long, curved toward the larger sepal, lipped, sepals all free, corolla limb three-toothed, middle tooth somewhat smaller than the others, pedicel about 15 mm. long in fruit, berry (apparently ripe) oblong, 15 mm. long, half as wide. [TEXT FIG. 4.]

PANAMA: Marraganti and vicinity, 3–60 m. altitude, April 3–9, 1908, *R. S. Williams 696*. Type in the herbarium of the New York Botanical Garden.

***Bihai barqueta* (Loes) comb. nov.**

*Heliconia barqueta* Loes, Verh. Bot. Verein. Brandenburg 51: 18. 1909. "Mexico in prov. Vera Cruz in distr. Jalapa ad fluvii ripam. in coffeeto Sel. n. 3609 Flor. Dec."

Closest to *B. Champneiana* from which it differs in the rose-colored inflorescence whose bracts are more distant than in that species. While this plant would appear to be safely distinct from *B. Champneiana* the relations found to exist between the orange and red bracted forms in Jamaica (see below) makes it desirable to have information concerning the flower characters not furnished by the description since recent studies have shown that these characters have great diagnostic value.

***Bihai borinquena coccinea* Griggs & Harris, var. nov.**

Closely similar to *B. borinquena* in the floral parts but differing in the brilliant scarlet-crimson bracts which are numerous and somewhat narrower than in the typical form of the species.

JAMAICA: cultivated at Hope Gardens, *W. Harris*. Pressed specimens in the herbarium of the New York Botanical Garden.

It is of interest to add in this connection that the orange-

bracted *Bihai borinquena* is common in Jamaica along with the red-fruited variety. This Jamaican plant differs but slightly from the Porto Rican type. From it, thanks to formalin specimens and very beautiful colored drawings made by Mr. Harris's assistant, Miss H. A. Wood, I am able to describe the flower which, by a typographical error, was stated to be 11 cm. long in the original description:

Flowers about fifteen, bracteoles yellow, firm when fresh, ovate-triangular, enveloping the flower; ovulary yellow, perianth 6 cm. long, white below, green on the exposed tips, bent somewhat toward the posterior sepal, with a conspicuous subgibbous expansion on the anterior side, filaments conspicuously bent into the expansion, perianth segments free above but partially fused below, staminode about 3 cm. long, reaching to the bend in the filaments; berry dark blue,  $10 \times 13$  mm., pedicel stout, fleshy, ringed, about 25 mm. long at maturity, seed  $10 \times 4$  mm., tubercled, horny.

***Bihai stricta* (Huber) comb. nov.**

*Heliconia stricta* Huber, Bol. Mus. Goeldi 4: 543. 1906.

TYPE LOCALITY: "Esta especie é bastante frequente nas fraldas do Cerro de Couchahuya; ella é cultivado no horto botanico do Museu Goeldi."

*Bihai stricta* is evidently closest to *B. humilis* but differs in the much wider branch-bracts.

***Bihai adflexa* sp. nov.**

Plant of medium size, leaves 60–80 cm. long, 15–20 cm. wide, oblong, narrowed to the base, tip not seen, green and glabrous on both sides, main veins prominent, 5–7 mm. apart; inflorescence deltoid, stiffly erect, peduncle apparently elongated, about 8 mm. in diameter, glabrous, rachis stiffly zigzag, puberulent, middle internodes about 15 mm. long, bracts twelve in the type, all ascending, scarlet, somewhat puberulent on the back, narrow, linear-oblong, obtuse, revolute, little concave, strongly bent upward near the base, whence the name, middle bracts about 7 cm. long, scarcely 2 cm. wide, the upper much smaller, the lower much larger: flowers numerous, bracteoles persistent,  $4 \times 1$  cm., with a thin evanescent pubescence both within and without; perianth 4 cm. long, sparingly pubescent like the bracteoles, sepals free, corolla limb three toothed. [TEXT FIG. 5.]

GUATEMALA: Coban, altitude 1,600 m., in deep forest, June

1908, *H. von Tuerckheim II* 2356. Type in the herbarium of the New York Botanical Garden.

The very narrow revolute bracts at once distinguish *B. adflexa* from all other species of the genus except *B. lingulata* and *B. revoluta*.

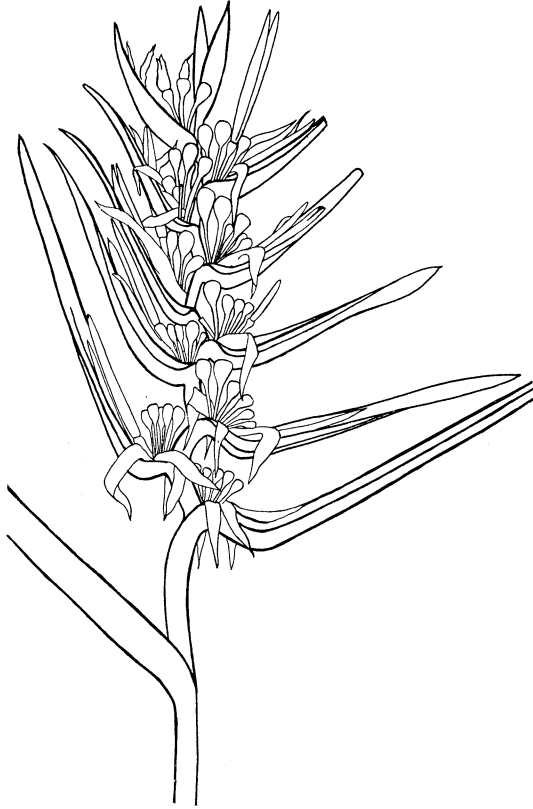


FIG. 5. *Bihai adflexa* Griggs; about half natural size.

There is small likelihood of its being confused with *B. revoluta* with its elongated, lax, pendent inflorescence. The resemblance to *B. lingulata* is closer but that species has larger, yellow inflorescence with wider bracts. It is, moreover, Peruvian.

***Bihai brasiliensis pulverulenta* (Lindl.) var. nov.**

*Heliconia pulverulenta* Lindl. Bot. Reg. **19**: pl. 1648. 1833.

Hook. Bot. Mag. **78**: pl. 4685. 1852.

*Bihai pulverulenta* Kuntze, Rev. Gen. Pl. **2**: 685. 1891.

In every detail except its slightly inferior size and its heavily farinose leaves *B. pulverulenta* corresponds precisely with *B. brasiliensis*. Although recognizing that glaucescence was sometimes evanescent and variable in amount, I have heretofore supposed that marked differences in this matter were sufficient criteria of specific distinctness. But the correspondence between these two species is so exact in every other respect that one has no other recourse than to throw them together. A specimen brought back from Rio de Janeiro by the United States Exploring expedition under Captain Wilkes is very interesting in this connection. It has the typical inflorescence of the two species; some of the leaves are cordate but others are narrowed to the base; some of them were clearly green and glabrous but others show evident signs of a heavy pulverulence which has been rubbed off except in a few protected spots! The reason that the similarity of the two plants was not recognized long ago is that glaucescence was made a primary character in the key so that they were never put close enough together to invite comparison.

***Bihai angusta*** (Vellozo) comb. nov.

*Heliconia angusta* Vellozo, Fl. Flum. Text 107. 1825. Plates 3: 20. 1827.

*Heliconia bicolor* Benth. Maund's Botanist 3: pl. 101. No date, 1837-1840? Regel, Gartenflora 5: 289. pl. 172. 1856.

*Heliconia angustifolia* Hook. Bot. Mag. 75: pl. 4475. 1849.

***Bihai straminea*** sp. nov.

Plant rather small, erect, habit cannoid, leaves reaching 35 cm. in length and 10 cm. in breadth, smaller in the type, the upper, at least, sessile, elliptical, acuminate, round at the base, glabrous, green on both sides; inflorescence erect, pale greenish yellow, peduncle glabrous, about 18 cm. long in the material seen, 2-3 mm. thick, rachis somewhat zigzag, minutely puberulent, internodes 10-15 mm.; bracts half a dozen or less, ascending, glabrous unless at the base, narrowly triangular, concave and boat-shaped, straight sided, widest at the base, acute, 3-10 cm. long, the largest about 12 mm. broad, tips of the lowest exceeding the uppermost: flowers few, bracteoles about 15 mm. long, less than 5 mm. wide, caducous after anthesis, glabrescent; pedicel, ovulary and calyx thickly and softly pubescent, perianth about 3 cm. long, with a

dark spot near the tip, strongly bent toward the large sepal somewhat as in *B. geniculata*, large sepal rolled back in flower, lateral sepals almost completely fused with the corolla or free, pedicel about 15 mm. (not mature). [TEXT FIG. 6.]

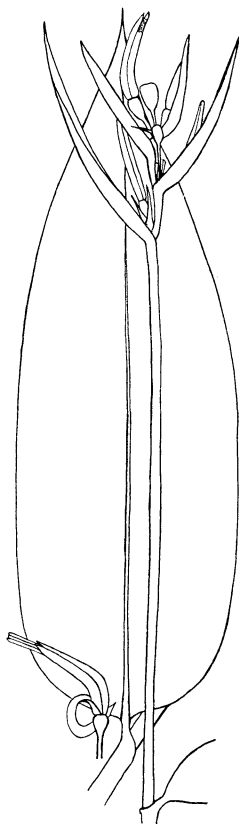


FIG. 6. *Bihai straminea* Griggs; about half natural size.

PANAMA: dry wooded hills around Alhajuila, prov. Panama, altitude 30–100 m. (Smithsonian Survey), January 11, 1911, *H. Pittier* 2328 (type in the National Herbarium, sheet 677138); between Miraflores and Corazal, Canal Zone, altitude 20–30 m. (Smithsonian Survey), January 3, 1911, *H. Pittier* 2200.

***Bihai Harrisiana* sp. nov.**

Erect, up to 4 m. tall, habit cannoid, leaves sessile, up to 30 cm. long and 11 cm. broad, broadly elliptical, acuminate, round



at the base, green and glabrous: inflorescence erect, glabrous, peduncle of variable length, rachis somewhat flexuose, internodes about 15 mm. long, bracts few, the lowest fertile one scarcely 10 cm. long, the upper about 6 cm., all about 15 mm. wide, narrowly lanceolate, obtuse or some of them acute, particolored, upper half bright crimson fading into greenish yellow below; flowers few, bracteoles about  $20 \times 7$  mm., early deciduous, perianth 25–30 mm. long, posterior sepal red, fading into orange on the edges and tip, conspicuously spotted with black at the tip, lateral sepals free, red, petals two, sometimes with the rudiment of a third, red, fading into green on the tip, pedicels 10–15 mm. long. [PLATE 19.]

JAMAICA: Leicesterfield, Upper Clarendon, *W. Harris 10841*, February 28, 1910; with the field note, "1,800 ft. alt. An erect growing plant with reed like stems up to 12 feet high, basal third of stems leafless, lower half of bracts orange yellow, upper half bright crimson, rhizome stout, creeping, flowers scarlet, tipped with green and white." (Type in the herbaria of the Ohio State University and the New York Botanical Garden; also cultivated in Hope Gardens, Jamaica.) "*Jamaica, Wilson*"! in *Herb. Gray*.

In addition to the information contained on the label Mr. Harris has favored me with a letter describing the habitat of the plant in greater detail as follows: "With regard to the new species from the Upper Clarendon I might say that it is fairly plentiful—usually in light shade but sometimes in the open. When growing in shade or partial shade the stems are usually twice as high as those growing in open situations. The most luxuriant clumps I saw were growing in partial shade near the edges of small streams, whilst plants in the open were yellowish in appearance and did not look happy. It is evidently a shade and moisture-loving plant.

"I saw some old stems this year that were fully 2 or 3 feet higher than the specimens measured by me last year, and it would be correct to give the height as 'up to 12 feet or over' and the habitat might be given as the 'upper reaches of the Rio Minho Valley, Upper Clarendon, 1,200 to 2,000 feet altitude.'"

It is a great pleasure to be able to associate with this beautiful species the name of so able and indefatigable a botanist as William Harris.

A dried specimen of *B. Harrisiana* would not ordinarily be distinguished from *B. hirsuta cannoidea* but in well dried material

it is evident that the scarlet of the ends of the bracts does not extend below the middle. The leaves, too, are larger and more broadly oval than in any of the specimens of the variety *cannoidea* (or related species) which have come under my observation while the stature far exceeds anything else recorded in the *Cannoideae*.

***Bihai hirsuta* (L.f.) comb. nov.**

*Heliconia hirsuta* L.f. Suppl. 158. 1781.

TYPE LOCALITY: "Habitat in America Meridionali."

IMPERFECTLY KNOWN SPECIES

The following species have also been described recently, but the descriptions given are so lacking in diagnostic characters as to make it inadvisable to assign them places in the key:

*HELICONIA ROBUSTA* Pax; Fedde, Rep. Nov. Sp. 7: 107. 1909

TYPE LOCALITY: "Bolivien Wälder um San Carlos bei Mapiri 700 m. (Buctien n. 1267 flowered July 1907)."

This plant is evidently one of the *Pendulae* but the description is inadequate either to differentiate it from previously described species or to identify it with them.

*HELICONIA PEARCEI* Rusby, Bull. N. Y. Bot. Garden 6: 494. 1910

"Probably at Santa Ana" (Bolivia).

Said to be "about intermediate between *H. psittacornu* [*psittacorum*] and *H. brasiliensis*." From the description, however, it would appear almost identical with *B. acuminata*.

**Explanation of plate 19**

BIHAI HARRISIANA Griggs

The figures, natural size, were drawn from specimens flowering in the Hope Gardens, Kingston, Jamaica, by Mr. Harris's assistant, Miss H. A. Wood.